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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,391	03/02/2005	Serge Gidon	122952	5189
25944	7590	11/14/2006	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			RIVERO, MINERVA	
			ART UNIT	PAPER NUMBER
			2627	

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/526,391

Applicant(s)

GIDON ET AL.

Examiner

Minerva Rivero

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. In the Remarks filed 8/8/06, Applicants submitted arguments for allowability of pending claims 18-34.

#### *Response to Arguments*

2. Applicant's arguments filed 8/8/06 have been fully considered but they are not persuasive.

Regarding claims 18-34 Applicants argue Zahorik fails to disclose a resistivity controlled material made of carbon. The examiner cannot concur with the Applicants; see Zahorik (*layer of insulating (resistive element) material*, [0036], Lines 1-3, see Fig. 4, element 36; *layer of carbon disposed on each side of the chalcogenide*, [0033], Lines 5-11).

Therefore the claims stay rejected.

#### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2627

4. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zahorik (US 2002/0006735), in view of Kuroda *et al.* (US Patent 5,751,686).

5. Regarding claim 18, Zahorik discloses a data recording device comprising a recording medium comprising a substrate whereon there is arranged a resistive layer, said resistive layer being covered by an active layer able to switch from a first electrical resistivity value to a second electrical resistivity value due to the action of a voltage applied between the micro-tips and a counter-electrode, device wherein at least one resistive element made of carbon is arranged between the active layer and the micro-tips, the resistive element having a controlled electrical resistivity comprised between the first and second electrical resistivity values of the active layer (*chalcogenide memory element*, [0008], Lines 6-11, see Fig. 4, element 28; *active area*, [0009], Lines 1-9 and [0034], Lines 11-17, see Fig. 4, element 34; *layer of insulating (resistive element) material*, [0036], Lines 1-3, see Fig. 4, element 36; *layer of carbon disposed on each side of the chalcogenide*, [0033], Lines 5-11).

However, Zahorik does not explicitly disclose but Kuroda *et al.* do disclose said data recording device comprises micro-tips (Col. 4, Lines 55-62, See Fig. 4, element 1203).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik with having the device comprise micro-tips, as disclosed by Kuroda *et al.*, in order to enable the device to record data on the recording medium.

Art Unit: 2627

6. Regarding claim 19, Zahorik discloses the resistive layer is made of carbon (*layer of insulating (resistive element) material*, [0036], Lines 1-3, see Fig. 4, element 36; *layer of carbon disposed on each side of the chalcogenide*, [0033], Lines 5-11; [0048], Lines 5-8).

7. Regarding claim 20, Zahorik discloses the resistive element comprises doping elements designed to adjust the electrical resistivity of the resistive element (*insulator layer is a dielectric material such as silicon nitride* (thus the silicon having been doped with nitrogen), [0036], Lines 3-6), and suggest the doping element is Phosphorous. [Phosphorous belongs to the same element group as Nitrogen, thus exhibiting similar dopant properties.]

However, Zahorik does not explicitly disclose but Kuroda *et al.* do disclose the doping element is Boron (*doping B by ion implantation*, Col. 12, Lines 46-47).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik and have the doping element be Boron, as disclosed by Kuroda *et al.*, since Boron is commonly used in the art as a p-type dopant.

8. Regarding claim 22, Zahorik discloses the resistive element is a layer arranged on the active layer (*layer of carbon disposed on each side of the chalcogenide*, [0033]).

Art Unit: 2627

9. Regarding claim 23, disclose the resistive layer has an electrical resistivity comprised between the first and second electrical resistivity values of the active layer (*layer of carbon blocks diffusion between chalcogenide layer and electrode layers*, (thus the resistivity of the carbon layer is necessarily higher than the lowest resistivity of the chalcogenide layer), [0033], Lines 5-11).

10. Regarding claim 25 Zahorik suggests the resistive layer comprises doping elements designed to adjust the electrical resistivity of the resistive layer, (*insulator layer is a dielectric material such as silicon nitride* (thus the silicon having been doped with nitrogen), [0036], Lines 3-6), and the doping element being Phosphorous [Phosphorous belongs to the same element group as Nitrogen, thus exhibiting similar dopant properties.]

However, Zahorik does not explicitly disclose but Kuroda *et al.* do disclose the doping elements are chosen from Boron, Silver and Copper (*doping B by ion implantation*, Col. 12, Lines 46-47; *growing Ag or Cu in the current-limiting thin-film resistor*, Col. 9, Line 66 – Col. 10, Line 8).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik and have the doping element be Boron, as disclosed by Kuroda *et al.*, since Boron is commonly used in the art as a p-type dopant, and to choose from Silver and Copper, as further disclosed by Kuroda *et al.*, in order to adjust the conductivity of the resistive element as needed.

Art Unit: 2627

11. Regarding claim 26, Zahorik discloses a protective layer of carbon arranged on the resistive element (*layer of carbon disposed on each side of the chalcogenide*, [0033], Lines 5-11; [0048], Lines 5-8) [See Applicant's Specification, resistive layer and resistive element are made of carbon ([0010] and [0019]).]

12. Regarding claim 27, Zahorik discloses a thermally insulating layer arranged between the substrate and the resistive layer ([0036]).

13. Regarding claim 28, Zahorik discloses the thermally insulating layer is formed by a crystallized germanium, antimony and tellurium compound ([0035]).

14. Regarding claim 29, Zahorik discloses the crystallized germanium, antimony and tellurium compound is obtained by momentary heating of the partially achieved recording medium ([0008], Lines 6-11).

15. Regarding claim 30, Zahorik discloses the crystallized germanium, antimony and tellurium compound is obtained from a binary germanium and tellurium compound ([0035], Lines 3-6).

16. Regarding claim 31, Zahorik discloses the active layer is formed by a phase change material (*material changes from an amorphous to a crystalline state*, [0008], Lines 6-11).

Art Unit: 2627

17. Regarding claim 33, Zahorik suggests the substrate being conducting, it constitutes the counter-electrode ([0038]).

18. Regarding claim 34, Zahorik discloses the substrate is made of doped silicon ([0043], Lines 3-8).

19. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zahorik (US 2002/0006735), in view of Nonaka *et al.* (US Patent 6,352,753).

Regarding claim 21, Zahorik does not disclose but Nonaka *et al.* do disclose the resistive element has a thickness of about 1 nm (*carbon layer as a boundary layer with a thickness between 0.5 nm and 4 nm*, Col. 7, Lines 64-67).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik with the resistive element having a thickness of about 1 nm, as disclosed by Nonaka *et al.*, in view of carbon film vapor deposition rate and repeatability, as further disclosed by Nonaka *et al.* (Col. 7, Lines 66-67).

20. Claims 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zahorik (US 2002/0006735), in view of Hintz (US Patent 5,353,268).



Art Unit: 2627

21. Regarding claim 24, Zahorik does not explicitly disclose but Hintz does disclose the resistive layer has a thickness comprised between 5 and 50 nm (Col. 12, Lines 27-28).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik and have the resistive layer have a thickness comprised between 5 and 50 nm, as disclosed by Hintz, since it is an appropriate thickness for the intended application.

22. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zahorik in view of Ohno *et al.* (US Patent 5,346,740).

23. Regarding claim 32, Zahorik does not explicitly disclose but Ohno *et al.* do disclose the active layer has a thickness smaller than or equal to 50 nm (*optically active layers between 1 and 10 nm*, Col. 2, Lines 62 – Col. 3, Line 2).

Therefore it would have been obvious to one ordinarily skilled in the art at the time of the invention to supplement the teachings of Zahorik and have the active layer have a thickness smaller than or equal to 50 nm, as disclosed by Ohno *et al.*, since limiting the thickness increases recording sensitivity, as further disclosed by Ohno *et al.* (Col. 3, Lines 3-7).

**Conclusion**

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

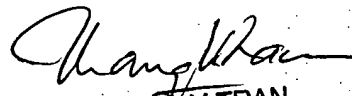
25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minerva Rivero whose telephone number is (571) 272-7626. The examiner can normally be reached on Monday-Friday 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2627

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MR 11/8//06

  
THANH V. TRAN  
PRIMARY EXAMINER